

REMARKS

Claim 1 is the sole examined independent claim and stands rejected under 35 U.S.C. § 103 over Yamazaki '841 in view of JP '555. This rejection is respectfully traversed for the following reasons. In particular, it is respectfully submitted that even assuming *arguendo* proper, the proposed combination does not disclose each and every limitation of claim 1.

Applicants' representative initiated a telephone interview with Examiner Gebremariam and Supervisory Examiner Lee. Applicants and Applicants' representative would like to thank both Examiner Gebremariam and Supervisory Examiner Lee for their courtesy in conducting the interview and for their assistance in resolving issues. A summary of the substantive discussion during the interview follows.

Claim 1 recites in pertinent part, "wherein said third semiconductor layer includes an emitter diffusion layer ... and a peripheral layer [which] includes the impurity of the second conductive type so as to be distributed at a high concentration in an upper part, at a low concentration at the center and at a high concentration in a lower part within the peripheral layer." Accordingly, the present invention defines a third semiconductor layer which has three concentration regions (i.e., high, low, high) in at least a peripheral layer thereof. In contrast, the alleged "third semiconductor layer" 2 of Yamazaki has only two concentration regions 5 (high) and 8 (low). The "high" concentration region 3 to the right of region 8 as viewed in Figure 2 is NOT part of the alleged "third semiconductor layer" 2. Rather, region 3 of Yamazaki is the base which the Examiner has already relied on as reading on the claimed "second semiconductor layer."

Indeed, as set forth at col. 3, lines 31-35, Yamazaki expressly discloses that the region 2 *consists* of only regions 5 and low concentration region 8, whereas region 3 is the base region (*see* col. 3, line 24). Accordingly, Yamazaki does not disclose or suggest, *inter alia*, a high-low-high impurity concentration within at least a peripheral layer of a third semiconductor layer in the manner recited in claim 1. It is noted that JP ‘555 was not relied on by the Examiner to modify Yamazaki to overcome the aforementioned deficiency.

During the interview, Supervisory Examiner Lee referenced Figure 3 of Yamazaki. In particular, Mr. Lee referenced region 9 as possibly being readable as a high concentration part of the claimed “peripheral layer.” However, it is respectfully submitted that region 9 of Yamazaki refers to a base region and therefore corresponds at best to the claimed “second semiconductor layer to be a base layer.” As set forth in several locations, Yamazaki expressly discloses region 9 as part of the base (*see, e.g.*, col. 2, lines 51-53; col. 4, line 34 and line 36; *see also* claim 4 of Yamazaki). Indeed, same as SiGe base region 3, region 9 is also a SiGe region; whereas region 2 is an epitaxial Si layer.

Mr. Lee noted col. 4, lines 20-23 as potentially distinguishing between region 9 and base region 3. However, it is respectfully submitted that this portion of Yamazaki merely describes the location of region 9 *relative to base region 3*, rather than substantively differentiating it from the base region 3. Moreover, it is respectfully submitted that the noted distinction between respective regions 3 and 9 of the collective “base region” disclosed in Yamazaki is that region 9 is non-doped while region 3 is doped (hence, the use of two reference numerals 3 and 9). In fact, Yamazaki expressly discloses that reference numeral 10 in Figure 3 “is an interface between the doped SiGe **base** and the non-doped SiGe **base** region, and designated at a numeral 11 is the concentration distribution of the **base** impurity diffused in the non-doped SiGe **base** region 9” (emphasis added; *see* col. 4, lines 32-36).

Even further, Yamazaki discloses that “[d]esignated at numerals 6 and 6’ is the Ge content in the SiGe **base** region 3” (*see* col. 3, lines 35-36, and Figure 3 wherein numerals 6 and 6’ are positioned exclusively in regions 3 **and 9**). Indeed, Yamazaki is directed to setting a desired Ge distribution across the **base** whereby in the Figure 3 embodiment “the Ge concentration distribution in the SiGe base is sloped from the interface between the non-doped SiGe layer 9 and the epitaxial Si layer 2” (*see* col. 4, lines 36-40) so that the SiGe base region 9 defines an outer boundary of the collective “base region” adjacent to the epitaxial Si layer 2.

The Examiner is directed to MPEP § 2143.03 under the section entitled "All Claim Limitations Must Be Taught or Suggested", which sets forth the applicable standard:

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (citing *In re Royka*, 180 USPQ 580 (CCPA 1974)).

In the instant case, the pending rejection does not "establish *prima facie* obviousness of [the] claimed invention" as recited in claim 1 because the proposed combination fails the "all the claim limitations" standard required under § 103.

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination. Based on all the foregoing, it is submitted that claims 1-5 are patentable over the cited prior art. Accordingly, it is respectfully requested that the rejection of claims 1-5 under 35 U.S.C. § 103 be withdrawn.

CONCLUSION

Having fully and completely responded to the Office Action, Applicants submit that all of the claims are now in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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